



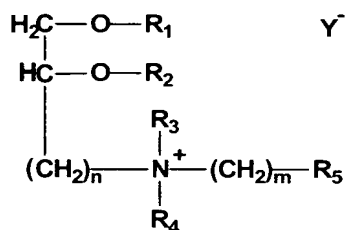
### *Amendments to the Claims*

The listing of claims will replace all prior versions, and listings of claims in the application.

Claims 1-63 (cancelled).

64. (Currently Amended) A method of delivering an anionic molecule into a cell, comprising:

- (a) contacting the anionic molecule with a composition comprising an effective amount of a compound according to the formula:



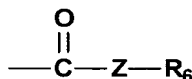
wherein  $\text{R}_1$  and  $\text{R}_2$  are independently H; linear or branched, unsubstituted or substituted  $\text{C}_{1-23}$  alkyl, acyl, alkenyl, or heteroalkyl group having from 0 to 6 sites of unsaturation; or a cyclic or aryl group, said heteroalkyl, cyclic, and aryl groups comprising from 0 to 5 heteroatoms wherein said heteroatoms are not the first atoms in said groups, wherein the substituent groups are selected from the group consisting of  $-\text{O}-(\text{CH}_2)_k-\text{CH}_3$ ,  $-\text{S}-(\text{CH}_2)_k-\text{CH}_3$ , and  $\text{X}-(\text{CH}_2)_k-$ , wherein X is a halide, and k is 0 to 4;

$\text{R}_3$  and  $\text{R}_4$  are independently H; linear or branched, unsubstituted or substituted  $\text{C}_{1-23}$  alkyl, acyl, alkenyl, or heteroalkyl group having from 0 to 6 sites of unsaturation; or a cyclic or aryl group, said heteroalkyl, cyclic, and aryl groups comprising from 0 to 5 heteroatoms wherein said heteroatoms are not the first atoms in said groups, wherein the

substituent groups are selected from the group consisting of

-O-(CH<sub>2</sub>)<sub>k</sub>-CH<sub>3</sub>, -S-(CH<sub>2</sub>)<sub>k</sub>-CH<sub>3</sub>, and X-(CH<sub>2</sub>)<sub>k</sub>-, wherein X is a halide, and k is 0 to 4;

R<sub>5</sub> has the structure



wherein Z is selected from the group consisting of O, S, NR<sub>1</sub>, NH, Se, and CR<sub>7</sub>R<sub>8</sub>;

R<sub>6</sub> is selected from the group consisting of H, R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, and R<sub>4</sub>, and, when Z is O, NH, NR<sub>1</sub>, or S, R<sub>6</sub> can further be an amino acid, peptide, polypeptide, protein, mono-, di- or polysaccharide, or other bioactive or pharmaceutical agent, wherein Z is an atom of said amino acid, peptide, polypeptide, protein, mono-, di- or polysaccharide, or other bioactive or pharmaceutical agent;

n is 1 to 6;

m is 1 to 10;

Y is a pharmaceutically acceptable anion; and

R<sub>7</sub> and R<sub>8</sub> independently or in combination are H or alkyl groups as defined for R<sub>1</sub> and R<sub>2</sub>;

wherein if Z is O, n is 1, and m is 3, then R<sub>6</sub> is selected from the group defined for R<sub>3</sub> and R<sub>4</sub> and wherein R<sub>1</sub> and R<sub>2</sub> are not both H; and

(b) contacting a cell with the lipid complex formed in step (a);

whereby a biologically effective amount of the anionic molecule is delivered into the cell.

65. (Withdrawn) The method according to claim 1, wherein  $R_1$  and  $R_2$  are  $C_{10}$  to  $C_{20}$  alkyl or alkenyl groups, Z is O and  $R_6$  is an amino acid or peptide linked to Z as an ester.

66. (Withdrawn) The method according to claim 64, wherein Z is O,  $R_1$  and  $R_2$  are identical and are selected from the group consisting of  $C_{14}H_{29}$  and  $(CH_2)_8CH=CH(CH_2)_7CH_3$ , and  $R_3$  and  $R_4$  are methyl.

67. (Withdrawn) The method according to claim 64, wherein  $R_1$  and  $R_2$  are saturated or unsaturated  $C_{10}$ - $C_{18}$  alkyl groups.

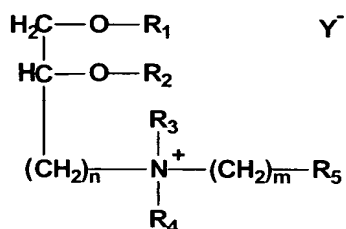
68. (Withdrawn) The method according to claim 64, wherein  $R_1$  and  $R_2$  are identical and are selected from the group consisting of  $C_{14}H_{29}$  and  $C_{12}H_{25}$ .

69. (Previously Presented) The method according to claim 64, wherein  $R_3$  and  $R_4$  are selected from the group consisting of  $C_1$ - $C_5$  alkyl groups and  $C_1$ - $C_5$  heteroalkyl groups having one heteroatom therein.

70. (Previously Presented) The method according to claim 69, wherein  $R_3$  and  $R_4$  are methyl groups.

71. (Previously Presented) A method of delivering an anionic molecule into a cell, comprising:

(a) contacting the anionic molecule with a composition comprising an effective amount of a compound according to the formula:

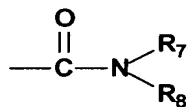


wherein

R<sub>1</sub> and R<sub>2</sub> are saturated or unsaturated C<sub>10</sub>-C<sub>18</sub> alkyl groups;

R<sub>3</sub> and R<sub>4</sub> are independently H; linear or branched, unsubstituted or substituted C<sub>1-23</sub> alkyl, acyl, alkenyl, or heteroalkyl group having from 0 to 6 sites of unsaturation; or a cyclic or aryl group, said heteroalkyl, cyclic, and aryl groups comprising from 0 to 5 heteroatoms wherein said heteroatoms are not the first atoms in said groups, wherein the substituent groups are selected from the group consisting of -O-(CH<sub>2</sub>)<sub>k</sub>-CH<sub>3</sub>, -S-(CH<sub>2</sub>)<sub>k</sub>-CH<sub>3</sub>, and X-(CH<sub>2</sub>)<sub>k</sub>-, wherein X is a halide, and k is 0 to 4;

R<sub>5</sub> has the structure:



R<sub>7</sub> and R<sub>8</sub> are independently selected from the group defined for R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub> and one of R<sub>7</sub> and R<sub>8</sub> can further be an amino acid, peptide, polypeptide, protein, mono-, di- or polysaccharide, or other bioactive or pharmaceutical agent, wherein an

amino nitrogen of said amino acid, peptide, polypeptide, protein, mono-, di- or polysaccharide, or other bioactive or pharmaceutical agent is the N to which R<sub>7</sub> or R<sub>8</sub> is attached;

n is 1 to 6;

m is 1 to 10; and

Y is a pharmaceutically acceptable anion; and

(b) contacting a cell with the lipid complex formed in step (a);

whereby a biologically effective amount of the anionic molecule is delivered into the cell.

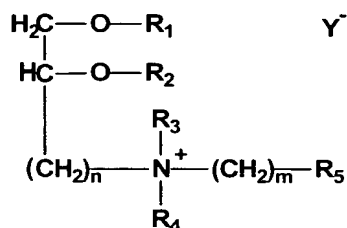
72. (Withdrawn) The method according to claim 71, wherein R<sub>1</sub> and R<sub>2</sub> are identical and are selected from the group consisting of C<sub>14</sub>H<sub>29</sub> and C<sub>12</sub>H<sub>25</sub>.

73. (Withdrawn) The method according to claim 72, wherein R<sub>3</sub> and R<sub>4</sub> are selected from the group consisting of C<sub>1</sub>-C<sub>5</sub> alkyl groups and C<sub>1</sub>-C<sub>5</sub> heteroalkyl groups having one heteroatom therein.

74. (Withdrawn) A compound according to claim 73, wherein R<sub>3</sub> and R<sub>4</sub> are methyl groups.

75. (Withdrawn) A method of delivering an anionic molecule into a cell, comprising:

(a) contacting the anionic molecule with a composition comprising an effective amount of a compound according to the formula:

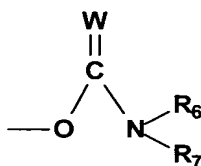


wherein

$\text{R}_1$  and  $\text{R}_2$  are saturated or unsaturated  $\text{C}_{10}$ - $\text{C}_{18}$  alkyl groups;

$\text{R}^3$  and  $\text{R}^4$  are independently H; linear or branched, unsubstituted or substituted  $\text{C}_{1-23}$  alkyl, acyl, alkenyl, or heteroalkyl group having from 0 to 6 sites of unsaturation; or a cyclic or aryl group, said heteroalkyl, cyclic, and aryl groups comprising from 0 to 5 heteroatoms wherein said heteroatoms are not the first atoms in said groups, wherein the substituent groups are selected from the group consisting of  $-\text{O}-(\text{CH}_2)_k-\text{CH}_3$ ,  $-\text{S}-(\text{CH}_2)_k-\text{CH}_3$ , and  $\text{X}-(\text{CH}_2)_k-$ , wherein X is a halide, and k is 0 to 4;

wherein  $\text{R}_5$  has the structure



wherein

$\text{R}_6$  and  $\text{R}_7$  are independently selected from the group defined for  $\text{R}_1$ ,  $\text{R}_2$ ,  $\text{R}_3$  and  $\text{R}_4$  and one of  $\text{R}_6$  and  $\text{R}_7$  can further be an amino acid, peptide, polypeptide, protein, mono-, di- or polysaccharide, or other bioactive or pharmaceutical agent, wherein an

amino nitrogen of said amino acid, peptide, polypeptide, protein, mono-, di- or polysaccharide, or other bioactive or pharmaceutical agent is the N to which R<sub>6</sub> or R<sub>7</sub> is attached;

W is O, NR<sub>8</sub>, NH, S, or Se;

R<sub>8</sub> is an alkyl group as defined for R<sub>1</sub> and R<sub>2</sub>;

n is 1 to 6;

m is 1 to 10; and

Y is a pharmaceutically acceptable anion; and

(b) contacting a cell with the lipid complex formed in step (a);

whereby a biologically effective amount of the anionic molecule is delivered into the cell.

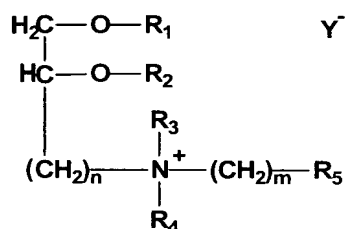
76. (Withdrawn) The method according to claim 75, wherein R<sub>1</sub> and R<sub>2</sub> are identical and are selected from the group consisting of C<sub>14</sub>H<sub>29</sub> and C<sub>12</sub>H<sub>25</sub>.

77. (Withdrawn) The method according to claim 76, wherein R<sub>3</sub> and R<sub>4</sub> are selected from the group consisting of C<sub>1</sub>-C<sub>5</sub> alkyl groups and C<sub>1</sub>-C<sub>5</sub> heteroalkyl groups having one heteroatom therein.

78. (Withdrawn) The method according to claim 77, wherein R<sub>3</sub> and R<sub>4</sub> are methyl groups.

79. (Withdrawn) A method of delivering an anionic molecule into a cell,  
comprising:

(a) contacting the anionic molecule with a composition comprising an  
effective amount of a compound according to the formula:

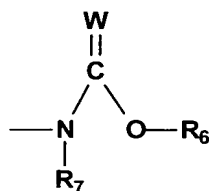


wherein

R<sub>1</sub> and R<sub>2</sub> are saturated or unsaturated C<sub>10</sub>-C<sub>18</sub> alkyl groups;

R<sub>3</sub> and R<sub>4</sub> are independently H; linear or branched, unsubstituted or substituted C<sub>1-23</sub> alkyl, acyl, alkenyl, or heteroalkyl group having from 0 to 6 sites of unsaturation; or a cyclic or aryl group, said heteroalkyl, cyclic, and aryl groups comprising from 0 to 5 heteroatoms wherein said heteroatoms are not the first atoms in said groups, wherein the substituent groups are selected from the group consisting of -O-(CH<sub>2</sub>)<sub>k</sub>-CH<sub>3</sub>, -S-(CH<sub>2</sub>)<sub>k</sub>-CH<sub>3</sub>, and X-(CH<sub>2</sub>)<sub>k</sub>-, wherein X is a halide, and k is 0 to 4;

wherein R<sub>5</sub> has the structure



wherein R<sub>6</sub> and R<sub>7</sub> are independently selected from the group defined for R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub> and one of R<sub>6</sub> and R<sub>7</sub> can further be an amino acid, peptide, polypeptide,



protein, mono-, di- or polysaccharide, or other bioactive or pharmaceutical agent, wherein a hydroxy oxygen of said amino acid, peptide, polypeptide, protein, mono-, di- or polysaccharide, or other bioactive or pharmaceutical agent is the O to which R<sub>6</sub> is attached;

W is O, NR<sub>8</sub>, NH, S, or Se;

R<sub>8</sub> is an alkyl group as defined for R<sub>1</sub> and R<sub>2</sub>;

n is 1 to 6;

m is 1 to 10; and

Y is a pharmaceutically acceptable anion; and

(b) contacting a cell with the lipid complex formed in step (a);

whereby a biologically effective amount of the anionic molecule is delivered into the cell.

80. (Withdrawn) The method according to claim 79, wherein R<sub>1</sub> and R<sub>2</sub> are identical and are selected from the group consisting of C<sub>14</sub>H<sub>29</sub> and C<sub>12</sub>H<sub>25</sub>.

81. (Withdrawn) The method according to claim 80, wherein R<sub>3</sub> and R<sub>4</sub> are selected from the group consisting of C<sub>1</sub>-C<sub>5</sub> alkyl groups and C<sub>1</sub>-C<sub>5</sub> heteroalkyl groups having one heteroatom therein.

82. (Withdrawn) The method according to claim 81, wherein R<sub>3</sub> and R<sub>4</sub> are methyl groups.

83. (Withdrawn) The method according to claim 64, wherein  
R<sub>6</sub> is selected from the group consisting of H, R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, and R<sub>4</sub>.

84. (Withdrawn) The method according to claim 64, wherein  
Z is O.

85. (Previously Presented) The method according to claim 64, wherein  
Z is NH or NR<sub>1</sub>.

86. (Previously Presented) The method according to claim 64, wherein said  
compound is selected from the group consisting of DORIE carboxylate (dioleoyl  
Rosenthal Inhibitor Ether carboxylate), DMRIE carboxylate (dimyristyl Rosenthal  
Inhibitor Ether carboxylate), DMRIE carboxylate propyl amide, DMRIE  
carboxylate(methionine-methylester)amide, DMRIE carboxylate(methionine-leucine-  
methylester)amide, and DMRIE carboxylate(methionine-leucine-phenylalanine-  
methylester)amide.

87. (Previously Presented) The method according to claim 71, wherein  
R<sub>7</sub> and R<sub>8</sub> are independently selected from the group defined for R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub> and  
R<sub>4</sub>.

88. (Withdrawn) The method according to claim 71, wherein

R<sub>1</sub> and R<sub>2</sub> are C<sub>10</sub> to C<sub>20</sub> alkyl or alkenyl groups, R<sub>7</sub> is H, and R<sub>8</sub> is an amino acid or peptide.

89. (Withdrawn) The method according to claim 75, wherein

R<sub>6</sub> and R<sub>7</sub> are independently selected from the group defined for R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub>.

90. (Withdrawn) The method according to claim 75, wherein said compound is selected from the group consisting of DMRIE methyl carbamate (dioleoyl Rosenthal Inhibitor Ether methyl carbamate), hydroxypropyl DMRIE methyl carbamate, and hydroxybutyl DMRIE methyl carbamate.